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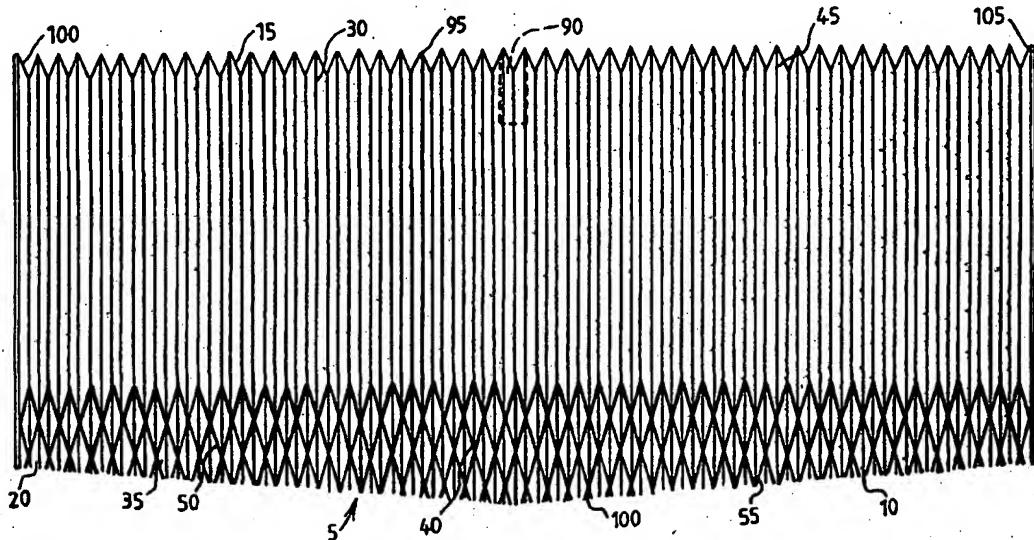
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(54) Title: IMPROVEMENTS IN OR RELATING TO SUN SHADES



(57) Abstract

There is disclosed an improved sun shade (5, 5a, 5b) particularly for use on an innermost side of a windscreen of a vehicle (110a). The shade (5a, 5b) comprises a sheet form member (10, 10a, 10b) having first and second opposing surfaces (15, 15a, 15b, 20, 20a, 20b) the surfaces (15, 15a, 15b, 20, 20a, 20b) being spaced one from the other by at least one gap (25, 25a, 25b). The first and second surfaces (15, 15a, 15b, 20, 20a, 20b) are formed on respectively pleated first and second layer members (30, 30a, 30b, 35, 35a, 35b). A further pleated layer member (40, 40a, 40b) is provided intermediate the first and second layer members (30, 30a, 30b, 35, 35a, 35b) adjacent apices (60, 65, 70, 75, 60a, 65a, 70a, 75a, 60b, 65b, 70b, 75b) of the pleats (40, 50, 55, 40a, 50a, 55a, 40b, 50b, 55b), being adhered such that the shade (5, 5a, 5b) is of an openably closable concertina form.

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IMPROVEMENTS IN OR RELATING TO SUN SHADES

5 This invention relates to an improved sun shade, and in particular, though not exclusively, to such a shade adapted for use in a vehicle.

10 Various designs of sun shade are known. Particularly various forms of sun shade are presently used, normally in warm climates, to at least partially cover a window of a stationary vehicle. The sun shade is typically used on an inner surface of a windscreen of the vehicle to seek to avoid the inside of the vehicle from becoming uncomfortably warm when the vehicle is not in use. It is hoped by employing such a shade that upon returning to the vehicle a person or persons may find the inside of the vehicle to be at a cooler temperature than if the sun shade had not been used. Prior to driving the vehicle the person will remove the sun shade from the windscreen.

15 Presently, the most commonly known sun shade comprises an elongate cardboard member adapted for retention on an innermost side of a vehicle windscreen, the member having a plurality of substantially equally spaced substantially transverse vertical hinges formed in the cardboard allowing the sun shade to be folded when not in use. The transverse hinges are typically spaced by approximately 20 100mm. This type of sun shade is available under the name 25 "CLIPY" (Registered Trademark).

30 Another known type of sun shade comprises a plastic roller blind attachable to a windscreen, or the like, by a plurality of suckers. Yet another known type of sun shade comprises a metallic/aluminium sheet, which sheet may 35 also provide a plurality of substantially transverse vertically spaced hinges. It is further known for people to resort to covering the outside of the windscreen with any available sheet material, e.g. woven material such as a towel or blanket.

35 It has been found that known sun shades do not perform as well as would be hoped.

-2-

It is, therefore, an object of the present invention to obviate or mitigate the aforementioned disadvantage in the prior art.

According to a first aspect of the present invention there is provided a sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap.

Preferably the at least one gap(s) is/are an air gap(s).

The first surface may be formed on a first layer member.

The second surface may be formed on a second larger member.

At least one further layer member may be provided intermediate the first and second layer members.

In a preferred embodiment one further layer member may be provided.

Advantageously each layer member is provided with a plurality of transverse pleats.

Preferably transverse pleats on each layer member are substantially equally spaced.

Advantageously adjacent apices of pleats formed in layer members facing one another may be adhered together.

The sun shade may, therefore, comprise a concertina form facilitating provision of a first, folded or closed position and a second, unfolded or opened position for the sun shade.

The sun shade may provide a plurality of spaced first transverse gaps between the first layer member and an at least one further layer member adjacent thereto.

The sun shade may, therefore, also provide a plurality of spaced second transverse gaps between the second layer member and an at least one further layer member adjacent thereto.

The sun shade may be adapted to be used on a window and in particular an innermost side of a window, e.g. a

windscreen, of a vehicle, e.g. an automobile.

5 The sun shade may be provided with a slotted portion substantially midway along an uppermost edge thereof which slotted portion facilitates use of the sun shade on vehicles having windscreen mounted rear view mirrors.

10 Alternatively the sun shade may be provided with a weakened removable portion, e.g. perforated portion, substantially midway along the uppermost edge, removal of the weakened portion providing the slotting portion.

15 Advantageously a lowermost edge of the sun shade may be formed as a shallow upwardly disposed V-shape.

The layer members of the sun shade may be fabricated from any suitable foldable rigid material.

20 Advantageously the layer members of the sun shade may be made from paper, but may also be made from cardboard or any like material.

25 The at least one further layer member(s) may be made from a more dense material than the first and second layer members.

30 In a preferred embodiment the at least one further layer member may be made from paper of weight 250 grams/m².

Further the first and second layer members may be made from paper of weight 240 grams/m².

35 Advantageously the adjacent apices may be adhered one to another by adhesive means such as glue, e.g. contact neoprene glue.

The sun shade may be provided with first and second end members, which end members may be disposed transversely relative to the layer members, may be adhered to one or more of the layer members, and may be made of a rigid material, e.g. cardboard.

35 The first surface may comprise a surface intended to be disposed adjacent an innermost surface of the vehicle windscreen, in use. The first surface may be of a light colour, and preferably may be white.

Advantageously the sun shade may have means for retaining the shade in association with a structure

-4-

intended to be shaded, in use.

The retaining means may comprise first and second retaining means carried on first and second ends of the shade, respectively.

5 The structure may be a vehicle windscreen.

The first and second retaining means may, in use, contact with corresponding first and second retaining means provided at or near first and second ends of the windscreen.

10 The retaining means may be made from VELCRO (Trade Mark), and may advantageously comprise elongate strips.

Advantageously the first and second retaining means are carried by first and second end members.

15 According to a second aspect of the present invention there is provided a vehicle having a sun shade mounted on an innermost side of a window thereof, the sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap.

20 According to a third aspect of the present invention there is provided a method of shading a vehicle from the sun, the method comprising the steps of:

25 providing a sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap; and

mounting the sun shade relative to an innermost surface of a window of the vehicle.

30 According to a fourth aspect of the present invention there is provided a sun shade for use on a vehicle windscreen, the sun shade comprising a sheet form member having first and second opposing surfaces, the sun shade having a convex edge, which edge is intended to be placed on or adjacent a lower edge of the vehicle windscreen, in use.

35 Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, which are:

-5-

Fig. 1 a schematic front view of a first embodiment of a sun shade according to the present invention in an opened position;

5 Fig. 2 a top view of the sun shade of Fig. 1 in an opened position;

Fig. 3 a top view of the sun shade of Fig. 1 in a closed position;

Fig. 4 an end view of the sun shade of Fig. 1 in a opened position;

10 Fig. 5 a partial front view of a vehicle having a second embodiment of a sun shade according to the present invention on an innermost side of a windscreen of the vehicle; and

Fig. 6 a partial view from inside the vehicle of Fig. 5 showing the sun shade on the innermost side of the windscreen of the vehicle.

Fig. 7 a schematic front view of a third embodiment of a sun shade according to the present invention in an opened position;

20 Fig. 8 an end view of the sun shade of Fig. 7.

Referring initially to Figs. 1 to 4, there is illustrated a first embodiment of a sun shade, generally designated 5, according to the present invention.

25 The sun shade 5 comprises a sheet form member 10 having first and second opposing surfaces 15,20, the surfaces 15,20 being spaced one from the other by at least one gap 25.

30 The first surface 15 is formed on a first layer member 30, while the second surface 20 is formed on a second layer member 35. In this embodiment one further layer member 40 is provided intermediate the first and second layer members 30,35.

35 Each layer member 30,35,40 is provided with a plurality of transverse pleats 45,50,55 adjacent transverse pleats 40,50,55 on each layer member 30,35,40 being substantially equally spaced. Further, adjacent apices 60,65,70,75 of pleats 40,50,55 formed in layer members

30,35,40 facing one another are adhered together.

In this way the sun shade 5 may, therefore, comprise an openably closable concertina form facilitating provision of a first folded, closed position (as shown in Fig. 3) and 5 a second unfolded, opened position (as shown in Fig. 1) for the sun shade 5.

As shown in Figs 1 and 2, in the opened position the sun shade 5 provides a plurality of spaced first transverse gaps 80 between the first layer member 30 and the further 10 layer member 40 adjacent thereto,

In the opened position the sun shade 5 also provides a plurality of spaced second transverse gaps 85 between the second layer member 35 and the further layer member 40 adjacent thereto.

15 The first embodiment of the sun shade 5 is adapted to be used on an innermost side of a windscreen of a vehicle (not shown).

20 The sun shade 5 may be provided with a weakened removable portion 90, e.g. perforated portion, substantially midway along an uppermost edge 95, removal of the weakened portion providing a slotted portion, which slotted portion facilitates use of the sun shade 5 on vehicles having windscreen mounted rear view mirrors.

25 Further a lowermost edge 100 of the sun shade 5 is formed as a shallow upwardly disposed V-shape to facilitate installation of the sun shade on the innermost surface of the windscreen.

30 The layer members 30,35,40 of the sun shade 5 may be fabricated from any suitable foldable rigid material. In this embodiment the layer members 30,35,40 of the sun shade 5 are made from paper, but it should be appreciated that they may also be made from cardboard or any like material. The further layer member 40 is advantageously made from a more dense material than the first and second layer members 35,30. In this embodiment the further layer member 40 is made from paper of weight 250 grams/m², and the first and second layer members 30,35 are made from paper of weight

-7-

240 grams/m². It has been found that the paper layer members should advantageously withstand direct sunlight temperatures through the glass windscreen of 100°C.

5 The adjacent apices 60,65,70,75 are adhered one to another by adhesive means such as glue, e.g. contact neoprene glue. It has been found that the contact glue should advantageously withstand temperatures of up to 120°C.

10 The sun shade 5 is provided with first and second end members 100,105, which end members 100,105 are disposed transversely relative to the layer members 30,35,40, are adhered to each of the layer members 30,35,40, and are made of a rigid material, e.g. cardboard having a thickness of 7mm.

15 The first surface 15 comprises a surface intended to be disposed adjacent an innermost surface of the vehicle windscreen, in use. The first surface 15 is advantageously of a light colour, and advantageously is white.

20 The sun shade 5 of this embodiment has the following approximate dimensions:

| | | | |
|----|---|---|--------|
| | Closed length | = | 60mm |
| | Opened length | = | 1440mm |
| 25 | Thickness | = | 78mm |
| | Height at mid point | = | 646mm |
| | Height at outer edges | = | 443mm |
| | Distance between adjacent apices of each layer in opened position | = | 30mm |

30 In use, the sun shade 5 should advantageously have been stored in the closed position. Before leaving the vehicle (not shown) a person(s) will open the sun shade 5 by pulling the first and second end members 100,105 away from one another, thereby causing the sunshade 5 to adopt the opened position of Fig. 1. The shade 5 may then be

-8-

conveniently placed adjacent the innermost side of the windscreen of the vehicle. The person may thereafter secure the vehicle and leave the vehicle unattended. On returning to the vehicle the sun shade 5 may be removed from the windscreen by the reverse procedure.

5 In an alternative method of use, the sun shade 5 may be placed adjacent the windscreen in a closed position and thereafter opened by a person(s) pulling the first and/or second end members 100,105 away from one another. The sun shade 5 may also be removed from the windscreen by reversing this alternative procedure.

10 The Applicant has tested a sun shade 5 according to the present invention. Test results, as detailed below illustrate the beneficial effects of employing a sun shade according to the present invention, which has been called 15 "FLEXY AUTO SHADE" (Trade Mark) by the Applicant.

TEST A

- 20 1) Temperature in sun outside car at 1.00 pm = 60°C
- 2) Temperature inside car windscreen at 1.00 pm = 80°C
(without any shade in position)
- 25 3) Temperature inside car on seat in sun at 1.00 pm = 80°C
(without any shade in position)
- 4) Erected Flexi Auto Shade when car already hot at 1.30 p.m.
- 30 5) Temperature in sun outside car at 1.30 p.m. = 60°C
- 6) Temperature inside car windscreen at 1.30 pm = 80°C
(with shade in position)
- 35 7) Temperature in sun outside car at 2.15 pm = 60°C
- 8) Temperature inside car windscreen at 2.25 pm = 75°C
(with shade in position)
- 40 9) Temperature inside car at 2.15 pm = 50°C
(with shade in position)
- 10) Temperature inside car windscreen at 3.50 pm = 80°C
(with shade in position)
- 45 11) Temperature inside car at 3.50 pm = 50°C
(with shade in position)

-9-

TEST B

- 1) Erected Flexy Auto Shade 9.00 am.
- 2) Temperature in sun outside car at 1.00 pm = 65°C
- 3) Temperature inside car windscreens at 1.00 pm = 80°C
- 5) (with shade in position)
- 4) Temperature inside car windscreens at 1.30 pm = 80°C
- 5) (with shade in position)
- 5) Temperature inside car at 1.30 pm = 50°C
- (with shade in position)

10

TEST C

- 1) Erected Flexy Auto Shade at 1.30 pm on parking car.
- 2) Temp inside car at 1.30 pm = 50°C
- 3) Temp inside car windscreens at 3.30 pm = 80°C
- 15) 4) Temp inside car at 3.30 pm = 50°C

The Applicant has further undertaken a comparative test with a prior art roller shade made of thin gauge plastic material, 412 mm wide. The test results are as follows.

TEST D

- 1) Temperature in sun outside car at 1.45 pm = 60°C
- 2) Temperature inside car at 1.45 pm = 50°C
- 25) 3) Erected roller shade at 1.45 pm
- 4) Temperature inside car windscreens at 2.15 pm = 80°C
- 5) Temperature inside car shade at 2.15 pm = 70°C
- 6) Temperature inside car in sunlight at 3.15 pm = 80°C
- 7) Note general outside temperature in shade was 37°.

30

Referring now to Figs. 5 and 6 there is illustrated

-10-

5 a second embodiment of a sun shade, generally designated 5', according to the present invention. The sun shade 5a is substantially similar to the sun shade 5 of the first embodiment, like parts being referred to by the same numerals but suffixed with an "a". The sun shade 5a is shown in situ adjacent an innermost surface of a windscreen 115' of a vehicle (car) 110a. As can be seen from Fig. 6 sun visors 120a, 125a of the vehicle 110a may be put down to assist in retaining the sun shade 5a in place.

10 Referring now to Figs. 7 and 8 there is illustrated a third embodiment of a sun shade, generally designated 5b, according to the present invention. The sun shade 5b is substantially similar to the sun shade 5 of the first embodiment, like parts being referred to by the same numerals but suffixed with a "b".

15 As can be seen from Figs. 7 and 8, the shade 5b is provided with first and second end members 100b, 105b, which end members 100b, 105b are disposed transversely relative to the layer members 30b, 35b, 40b and are adhered to each of the layer members 30b, 35b, 40b.

20 The end members 100b, 105b carry first and second retaining means 106b, 107b in the form of VELCRO (Trade Mark) strips. The vehicle provides corresponding first and second retaining means 108b, 109b also in the form of VELCRO (Trade Mark) strips at or near respective ends of the windscreen 86b.

25 In use, respective first strips 106b, 108b and second strips 107b, 109b co-act so as to seek to retain the shade 5b across the windscreen 86b.

30 It has been found that provision of the retaining means 106b, 107b, 108b, 109b allows the shade 5b to be suitably located and retained, while the concertina design of the shade 5b allows for movement, caused by expansion and/or contraction.

35 It will be appreciated that suitable retaining means other than VELCRO fastenings may be employed.

The shade 5b has a convex lowermost edge 100b, which

-11-

edge 100b is adapted and intended to be placed on or adjacent a lower edge of the vehicle windscreen 86, in use. This allows the shade 5b when in an open position to at least approximately fit the curvature of the windscreen 86b, as a result fitting tightly against the glass of the windscreen 86b along the full length of the windscreen 86b and also keeping the shade 5b in position.

In this embodiment the lowermost edge 10b of the sun shade 5b is formed as a shallow upwardly disposed U-shape to facilitate installation of the sun shade 5b on the innermost surface of the windscreen 86b.

The sun shade 5b of this embodiment has the following approximate dimensions:

| | | | |
|----|-----------------------|---|--------|
| 15 | Closed length | = | 60mm |
| | Opened length | = | 1440mm |
| | Thickness | = | 78mm |
| | Height at mid point | = | 646mm |
| | Height at outer edges | = | 443mm |

| | | | |
|----|---|---|-------|
| 20 | Distance between adjacent apices of each layer in opened position | = | 30mm |
| | Length of VELCRO strips | = | 350mm |

25 The embodiments of the invention hereinbefore described are given by way of example only, and are not meant to limit the scope of the invention in any way. Particularly it should be appreciated that the sun shade may be made of any suitable lightweight flexible material. 30 Further although an advantageous embodiment of the sun shade would be dimensional to be suitable for use on a number of vehicles, e.g. automobiles, specific embodiments of the sun shade may be dimensioned to be used specifically with particular makes and model of vehicle.

35

-12-

CLAIMS

1. A sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap.
- 5
2. A sun shade as claimed in claim 1, wherein the first surface is formed on a first layer member.
- 10 3. A sun shade as claimed in either of claims 1 or 2, wherein the second surface is formed on a second layer member.
4. A sun shade as claimed in claim 3, wherein at least 15 one further layer member is provided intermediate the first and second layer members.
5. A sun shade as claimed in claim 4, wherein one further layer member is provided.
- 20 6. A sun shade as claimed in any of claims 3, 4 or 5, wherein each layer member is provided with a plurality of transverse pleats.
- 25 7. A sun shade as claimed in claim 6, wherein the adjacent transverse pleats on each layer member are substantially equally spaced one from the other.
8. A sun shade as claimed in either of claims 6 or 7, 30 wherein adjacent apices of pleats formed in layer members facing one another are adhered together.
9. A sun shade as claimed in claim 8, wherein the sun shade comprises a concertina form facilitating provision of a first folded, closed position and a 35 second unfolded, opened position for the sun shade.

-13-

10. A sun shade as claimed in either of claims 8 or 9, wherein the sun shade provides a plurality of spaced first transverse gaps between the first layer member and an at least one further layer adjacent thereto.
- 5 11. A sun shade as claimed in any of claims 8, 9 or 10, wherein the sun shade provides a plurality of spaced second transverse gaps between the second layer member and at least one further layer member adjacent thereto.
- 10 12. A sun shade as claimed in any preceding claim, wherein the sunshade is adapted to be used on a window.
- 15 13. A sun shade as claimed in claim 12, wherein the sun shade is adapted to be used on an innermost side of a window such as a windscreen of a vehicle.
- 20 14. A sun shade as claimed in any preceding claim, wherein the sun shade is provided with a slotted portion substantially midway along an uppermost edge thereof.
- 25 15. A sun shade as claimed in any of claims 1 to 13, wherein the sun shade is provided with a weakened removable portion, such as a perforated portion, substantially midway along the uppermost edge removal of the weakened portion providing a slotted portion.
- 30 16. A sun shade as claimed in any preceding claim, wherein a lowermost edge of the sun shade is formed as a shallow upwardly disposed V-shape.
- 35 17. A sun shade as claimed in either of claims 3 or 4 or any of claims 5 to 16 wherein dependent on claim 2, wherein the layer members of the sun shade are

-14-

fabricated from a foldable rigid material.

18. A sun shade as claimed in claim 17, wherein the layer members of the sun shade are made from paper.

5

19. A sun shade as claimed in claim 4 or any of claims 5 to 18 when dependent upon claim 4, wherein the at least one further layer member(s) is/are made from a more dense material than the first and second layer members.

10

20. A sun shade as claimed in claim 18 or claim 19 when dependent upon claim 18, wherein the at least one further layer member is made from paper of weight 250 grams/m².

15

21. A sun shade as claimed in claim 18, claim 19 when dependent on claim 18, or upon claim 20, wherein the first and second layer members are made from paper of weight 240 grams/m².

20

22. A sun shade as claimed in claim 8 or any of claims 9 to 21 when dependent upon claim 8, wherein the adjacent apices are adhered one to another by adhesive means such as glue.

25

23. A sun shade as claimed in claim 22, wherein the adhesive means are contact neoprene glue.

30

24. A sun shade as claimed in any of claims 3 to 23, wherein the sun shade is provided with first and second end members, which end members are disposed transversely relative to the layer member, are adhered to one or more of the layer members, and are formed of a rigid material such as cardboard.

35

25. A sun shade as claimed in any of claims 1 to 24,

-15-

wherein the first surface comprises a surface intended to be disposed adjacent an innermost surface of the vehicle windscreen, in use.

5 26. A sun shade as claimed in any of claim 1 to 25, wherein the first surface is of a light colour, such as white.

10 27. A sun shade as claimed in any of claims 1 to 26, wherein the at least one gap is/are an air gap(s).

15 28. A sun shade as claimed in any preceding claim, wherein the sunshade has means for retaining the shade in association with a structure intended to be shaded, in use.

20 29. A sun shade as claimed in claim 28, wherein the retaining means comprise first and second retaining means carried on first and second ends of the shade, respectively.

30. A sun shade as claimed in either of claims 28 or 29, wherein the structure is a vehicle windscreen.

25 31. A sun shade as claimed in claim 29, wherein the first and second retaining means co-act with corresponding first and second retaining means provided at or near respective first and second ends of the windscreen.

30 32. A sun shade as claimed in claim 31, wherein the retaining means are made from VELCRO (Trade Mark).

35 33. A sun shade as claimed in either of claims 31 or 32, wherein the retaining means comprise elongate strips.

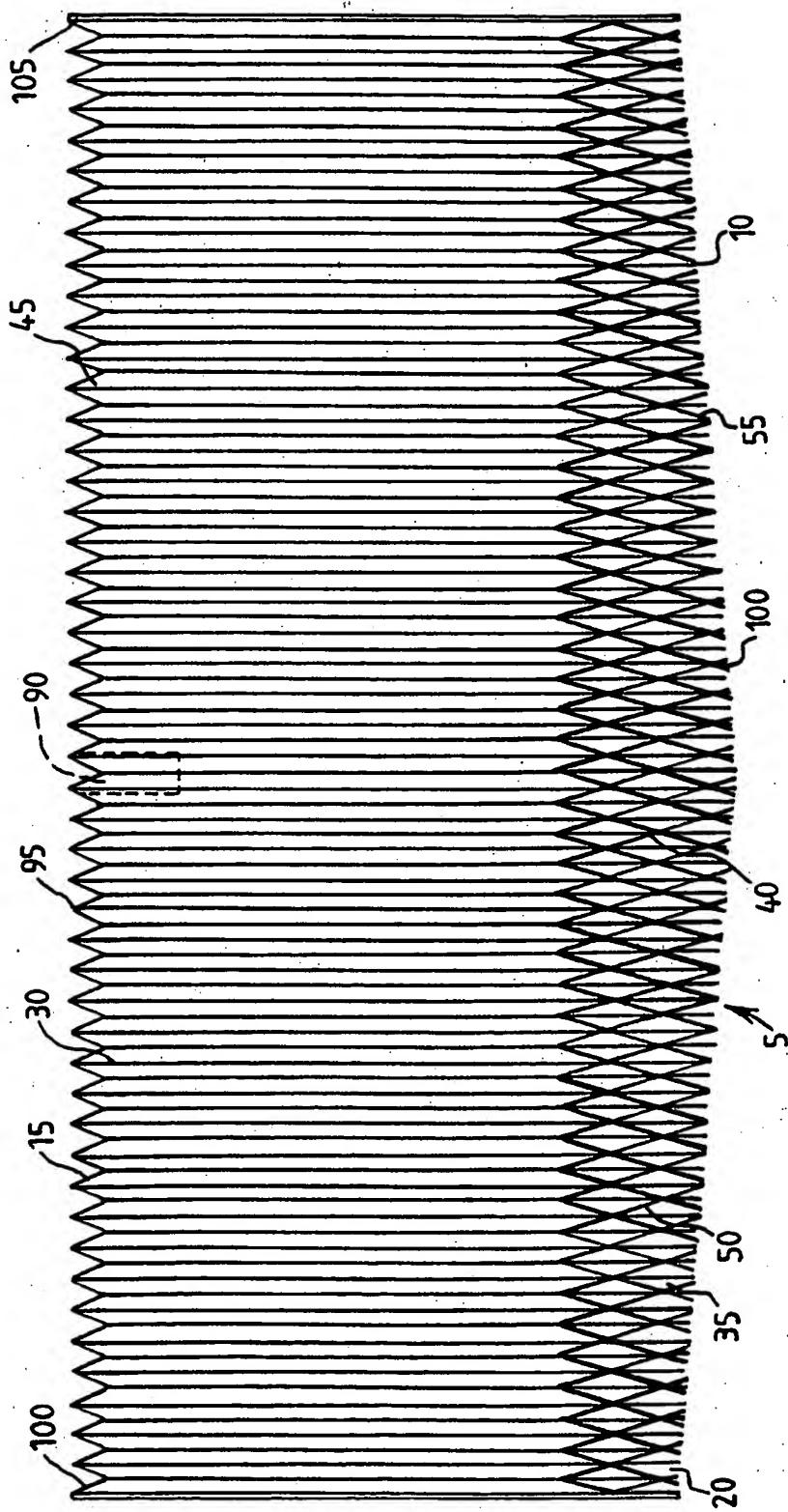
34. A sun shade as claimed in any of claims 29 to 33, wherein the first and second retaining means are

-16-

carried by first and second end members.

35. A vehicle having a sun shade mounted on an innermost side of a window thereof, the sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap.
36. A method of shading a vehicle from the sun, the method comprising the steps of:
 - providing a sun shade comprising a sheet form member having first and second opposing surfaces, the surfaces being spaced one from the other by at least one gap;
 - mounting the sun shade relative to an innermost surface of a window of the vehicle.
37. A sun shade comprising a sheet form member having first and second opposing surfaces, the sun shade having a convex edge, which edge is intended to be placed on or adjacent a lower edge of a vehicle windscreen.
38. A sun shade as hereinbefore described with reference to Figs. 1 to 4, Figs. 5 to 6 or Figs. 7 to 8.
39. A vehicle having a sun shade mounted on an innermost side of a window thereof as hereinbefore described with reference to Figs 1 to 4, Figs. 5 to 6 or Figs. 7 to 8.
40. A method of shading a vehicle as hereinbefore described with reference to Figs. 1 to 4, Figs. 5 to 6 or Figs. 7 to 8.

1/4



2/4

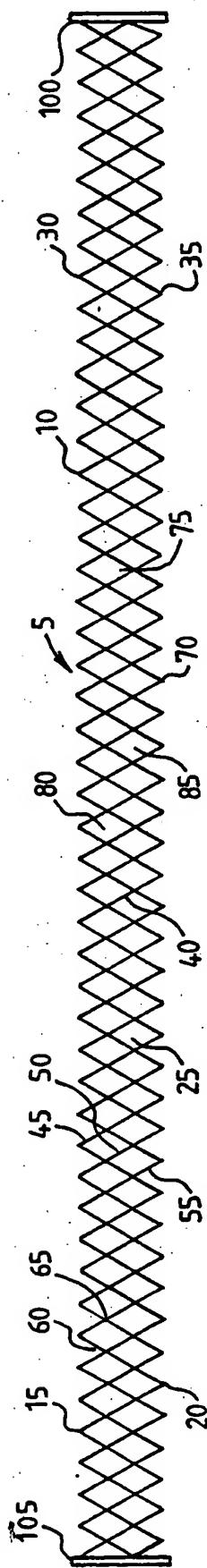


FIG. 2

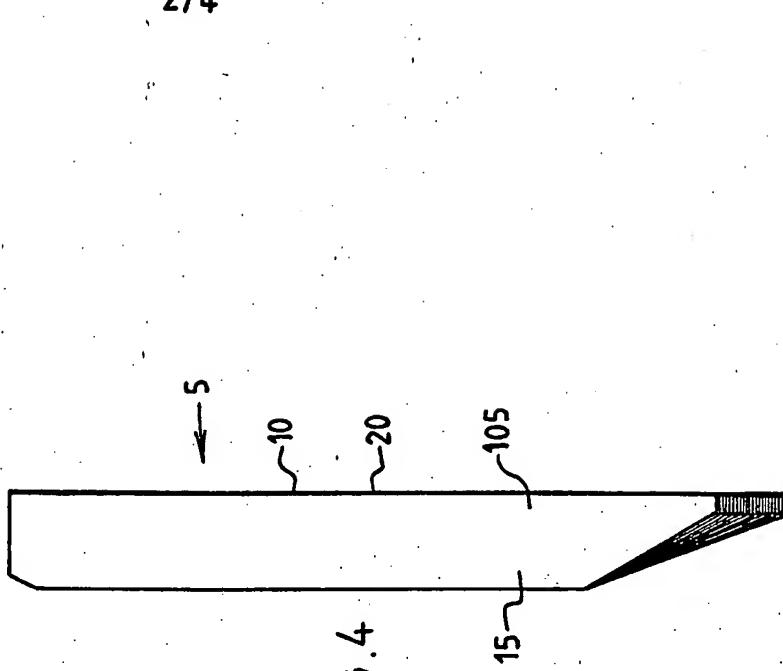


FIG. 4



FIG. 3

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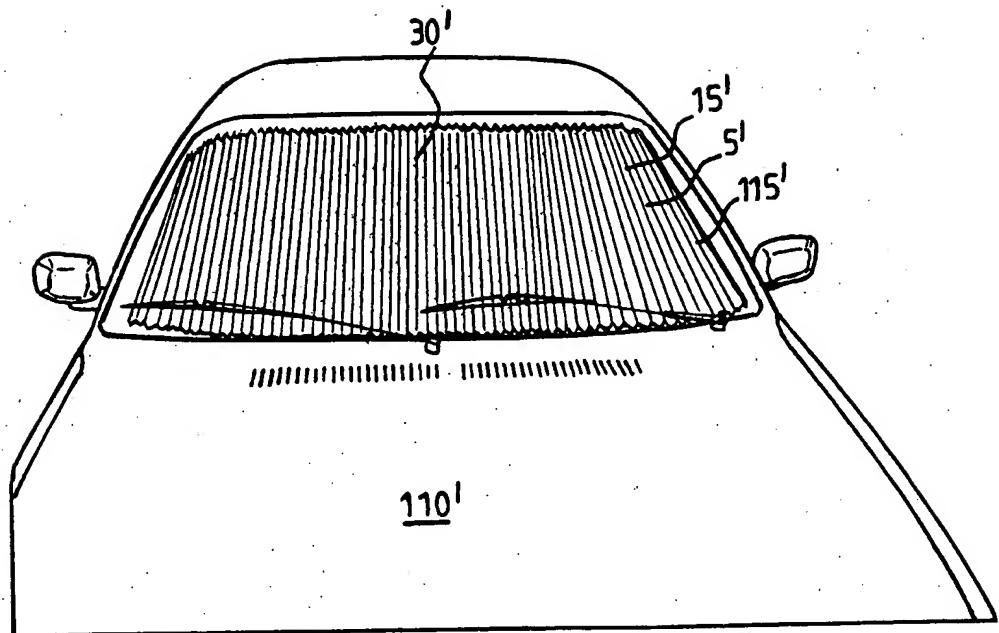


FIG.5

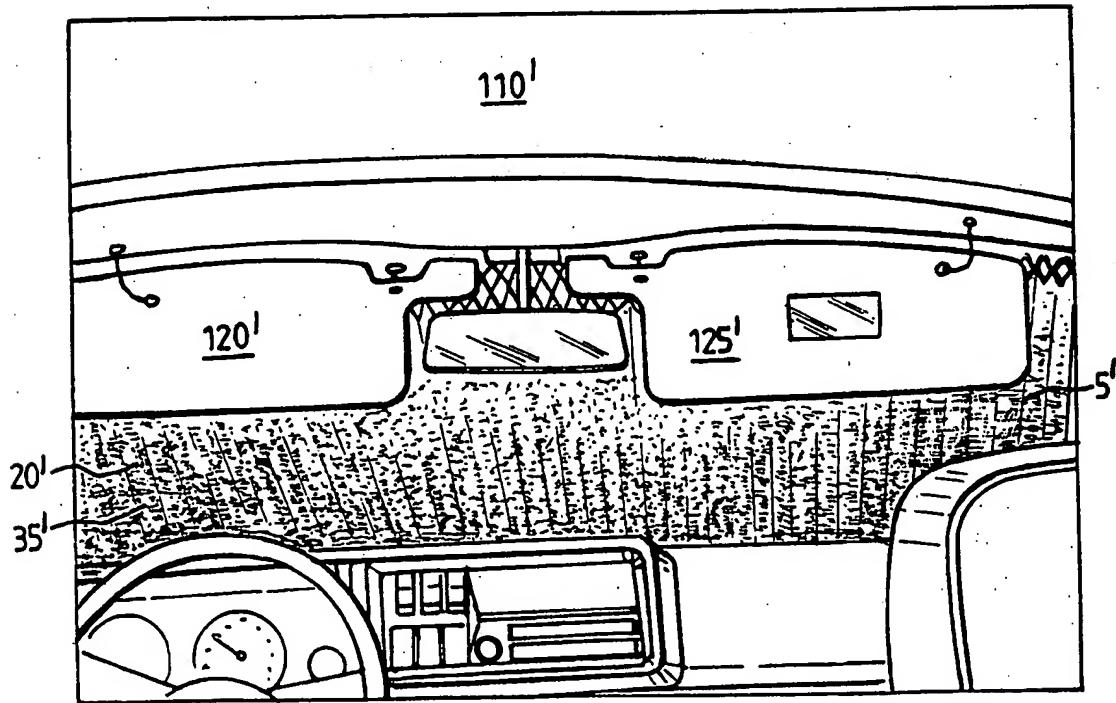


FIG.6

414

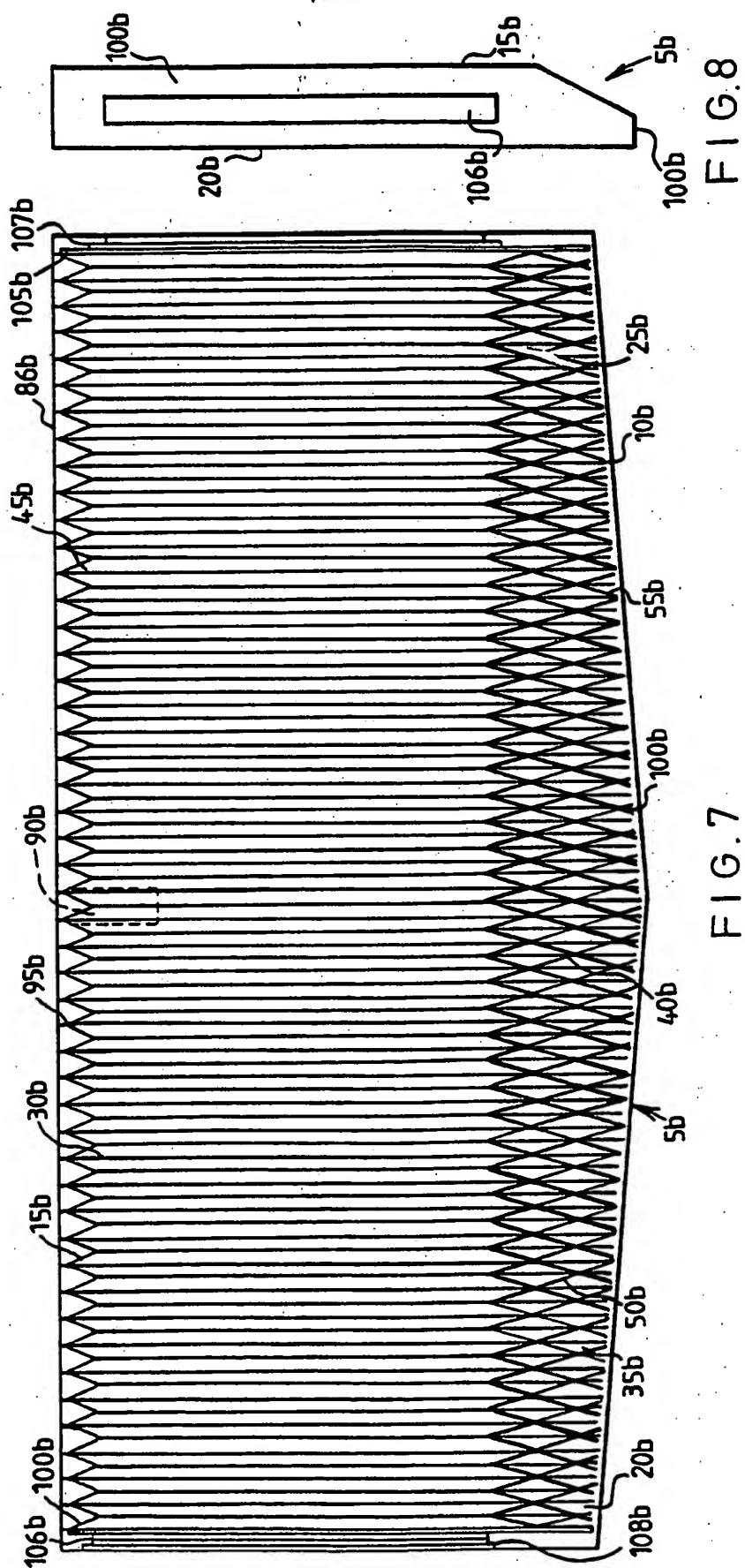


FIG. 7

FIG. 8

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/02122

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B60J1/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B60J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|--|--|
| X | WO 88 00140 A (ELDRIDGE) 14 January 1988 see page 11 - page 14; figures | 1-3, 6, 7, 9, 12, 13, 17, 25, 27-37 |
| A | US 4 805 955 A (LEVY) 21 February 1989 see claims; figures | 1, 14, 15 |
| A | DE 87 07 905 U (RODE) 24 September 1987 see claims; figures | 1, 14 |
| A | US 5 184 659 A (ALCOCER) 9 February 1993 see column 3 - column 4; figures | 1-5 |
| A, P | DE 297 19 452 U (SEITZ) 15 January 1998 -/- | |

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

16 October 1998

Date of mailing of the international search report

26/10/1998

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|--|-----------------------|
| A | EP 0 707 127 A (LIN YUNG-CHIN) 17 April 1996 | |
| A | US 4 838 334 A (JUDY S. HOGG) 13 June 1989 | |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/02122

| Patent document cited in search report | Publication date | Patent family member(s) | | Publication date |
|--|------------------|-------------------------|------------|-------------------------|
| WO 8800140 A | 14-01-1988 | AU 7691687 A | 29-01-1988 | US 4886104 A 12-12-1989 |
| US 4805955 A | 21-02-1989 | NONE | | |
| DE 8707905 U | 24-09-1987 | NONE | | |
| US 5184659 A | 09-02-1993 | NONE | | |
| DE 29719452 U | 15-01-1998 | NONE | | |
| EP 707127 A | 17-04-1996 | NONE | | |
| US 4838334 A | 13-06-1989 | NONE | | |

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